

Alteration of Serum Immunoglobulin Levels after Splenectomy in Thalassaemia

Suchandra Sett¹ and Rupnarayan Sett²

1. Indian Institute of Chemical Biology (CSIR), Calcutta, West Bengal, India

2. Institute of Rain & Moist Deciduous Forest Research (ICFRE), Jorhat 785 001, Assam, India

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ABSTRACT Levels of serum immunoglobulins within a month after splenectomy were investigated in cases of homozygous beta thalassaemia and e-beta thalassaemia in India. Elevation in the level of IgM was most striking indicating fresh infection(s) by organism(s) after splenectomy. Elevations in the levels of IgG and IgA were also observed. The findings suggest that an early prophylaxis should be instituted for splenectomised thalassaemic patients to strengthen their immune status.

INTRODUCTION

Thalassaemia patients are primarily diagnosed by possession of the symptoms like retarded developmental milestones, short stature, monogloid face, towering of skull, dental deformation, blackish body colour, protruberant abdomen, hepatosplenomegaly and chronic anaemia. Anaemia and iron overload are respectively managed by blood transfusion and by administration of iron-chelating drugs like desferrioxamine (Bunn, 1987).

Splenectomy continues to be advised for patients of thalassaemia major. The extent and timing of the infections of which patients become prone after splenectomy has been the subject of much concern (Wintrobe et al., 1981). In the present study, the changes in the levels of serum immunoglobulins within a month after splenectomy have been studied. This may have relevance to the time from which post-splenectomised thalassaemic patients need chemoprophylaxis.

MATERIAL AND METHODS

A total of 20 thalassaemia patients (age 14.4 ± 3.5 years) including 10 cases each of homozygous beta thalassaemia (group I) and of e-beta thalassaemia (group II) diagnosed by haemoglobin electrophoresis as per standard procedure (Chandra et al., 1987; Adhikary et al., 1987) were included in the study. Blood samples for estimation of immunoglobulins were drawn just before splenectomy and 4 weeks after splenectomy. Immunoglobulins were estimated by the single radial immunodiffusion technique (Mancini et al., 1965) using tripartite plates (Behring, Hoechst India Ltd., Bombay).

RESULTS AND DISCUSSION

The immunoglobulin estimations of the above described patients are presented in table 1. The results indicate that after 4 weeks of splenectomy there were elevations in the levels of IgG and IgM in both homozygous beta thalassaemia as well as e-beta thalassaemia. Elevation of IgA occurs in cases of homozygous beta thalassaemia. The most prominent elevation has been marked for IgM. The levels were also found higher at another time-point in the same group of patients, data of which are not shown due to its incompleteness; a few patients left follow-up treatment before the study was completed. The stimulus for such elevation has not been readily identified because clinically evident infections were not detected. Therefore subclinical infections are likely.

1 Address all correspondence to Rupnarayan Sett

Table 1: Immunoglobulin levels before and after splenectomy

Class of Ig	Value of Ig in normal controls*	Group of patients	Values of Ig*		P value
			Pre-splenectomy	Post-splenectomy	
G	1477.60±87.61	I	2493.38±474.74	2636.15±481.87	<0.05
		II	1966.80±256.26	2097.26±249.60	<0.05
M	128.20±14.63	I	125.48±3.93	169.80±26.15	<0.01
		II	130.09±10.26	144.90±19.82	<0.05
A	188.25±20.82	I	207.53±28.20	219.21±30.84	<0.05
		II	191.80±23.39	201.74±26.34	>0.05

*Mean ± S.D. in mg/dl

This study shows that after splenectomy the patients have retained the ability to produce elevated immunoglobulin levels. If infection was the cause, elevated IgG would suggest infection by those organism(s) with which the patients had contact prior to splenectomy; elevated IgM would suggest infection by organism(s) with which the patients did not have previous contact. Both findings indicate the necessity of instituting early chemoprophylaxis in splenectomised thalassaemic individuals. The elevated IgA level after splenectomy in homozygous beta thalassaemia has been an unexplained feature. It may or may not have a relation with the profile of possible pathogens in tropical areas.

The immunoglobulin levels were also found to some extent elevated in some other cases of splenectomy in kala-azar patients (unpublished observation) which indicate that this elevation may have a correlation with splenectomy and may not be a unique feature in thalassaemia diseases. On the other hand, such elevations were not observed in postoperative periods in some other major surgical operations as seen upto 2 months (unpublished observation) which further advocates in favour of the possible correlation between splenectomy and elevated immunoglobulin levels.

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